

1. A novel structure for a photodiode comprising:
 - a p-type region extending to the surface of a semiconductor substrate;
 - a multiplicity of parallel finger-like n-wells formed in said p-type region that are connected to a conductive region at one end.
2. The structure of Claim 1 wherein said p-type region is a p-substrate.
3. The structure of Claim 1 wherein said p-type region is a p-well.
4. The structure of Claim 1 wherein said parallel finger-like n-wells are formed by phosphorous ion implantation.
5. The structure of Claim 1 wherein the depth of said parallel finger-like n-wells is between about 1 and 5 microns.
6. The structure of Claim 1 wherein the width of said parallel finger-like n-wells is between about 0.5 and 2 microns.
7. The structure of Claim 1 wherein the separation of said parallel finger-like n-wells is between about 0.5 and 2 microns.
8. The structure of Claim 1 wherein the number of fingers in said parallel finger-like n-wells is greater than 3.
9. A method of fabricating a novel structure for a photodiode comprising:

Providing a p-type region of a semiconductor substrate extending to the surface of said semiconductor substrate;

Forming a multiplicity of parallel finger-like n-wells in said p-type region that are connected to a conductive region at one end.

10. The method of Claim 9 wherein said p-type region is a p-substrate.
11. The method of Claim 9 wherein said p-type region is a p-well.
- 5 12. The method of Claim 9 wherein said parallel finger-like n-wells are formed by phosphorous ion implantation.
13. The method of Claim 9 wherein the depth of said parallel finger-like n-wells is between about 1 and 5 microns.
14. The method of Claim 9 wherein the width of said parallel finger-like n-wells is between about 0.5 and 2 microns.
- 10 15. The method of Claim 9 wherein the separation of said parallel finger-like n-wells is between about 0.5 and 2 microns.
16. The method of Claim 9 wherein the number of fingers in said parallel finger-like n-wells is greater than 3.
- 15 17. A novel structure for a photodiode comprising:
 - an n-type region extending to the surface of a semiconductor substrate;
 - a multiplicity of parallel finger-like p-wells formed in said n-type region that are connected to a conductive region at one end.
- 20 18. The structure of Claim 17 wherein said p-type region is an n-substrate.
19. The structure of Claim 17 wherein said p-type region is an n-well.

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20. The structure of Claim 17 wherein said parallel finger-like p-wells are formed by implantation of BF2 ions.

21. The structure of Claim 17 wherein the depth of said parallel finger-like p-wells is between about 1 and 5 microns.

22. The structure of Claim 17 wherein the width of said parallel finger-like p-wells is between about 0.5 and 2 microns.

23. The structure of Claim 17 wherein the separation of said parallel finger-like p-wells is between about 0.5 and 2 microns.

24. The structure of Claim 17 wherein the number of fingers in said parallel finger-like p-wells is greater than 3.

25. A method of fabricating a novel structure for a photodiode comprising:

Providing an n-type region of a semiconductor substrate extending to the surface of said semiconductor substrate;

Forming a multiplicity of parallel finger-like p-wells in said n-type region that are connected to a conductive region at one end.

26. The method of Claim 25 wherein said n-type region is an n-substrate.

27. The method of Claim 25 wherein said n-type region is an n-well.

28. The method of Claim 25 wherein said parallel finger-like p-wells are formed by implantation of BF2 ions.

29. The method of Claim 25 wherein the depth of said parallel finger-like p-wells is between about 1 and 5 microns.

30. The method of Claim 25 wherein the width of said parallel finger-like p-wells is between about 0.5 and 2 microns.
31. The method of Claim 25 wherein the separation of said parallel finger-like p-wells is between about 0.5 and 2 microns.
32. The method of Claim 25 wherein the number of fingers in said parallel finger-like p-wells is greater than 3.